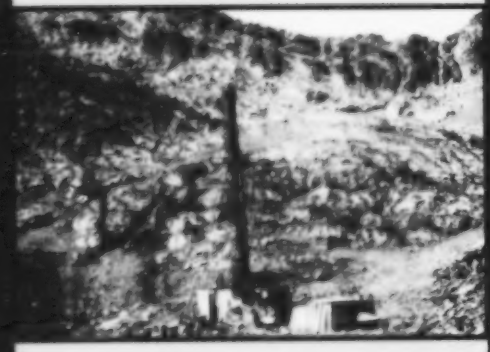

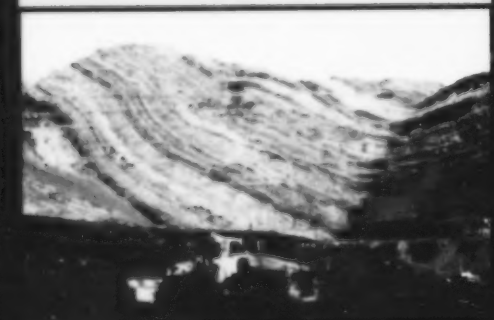

British Columbia Mines and Mineral Exploration Overview 2005

Information Circular 2006-1

106-03134/

BRITISH COLUMBIA MINING AND MINERAL EXPLORATION OVERVIEW 2005

Ministry of Energy, Mines and Petroleum Resources

Tom Schroeter, PEng/PGeo; Michael Cathro, PGeo; David Grieve, PGeo; Robert Lane, PGeo; Jamie Pardy, PGeo; and Paul Wojdak, PGeo

INTRODUCTION

British Columbia's mineral resources are strategically located to play a role in the international mining industry, particularly for North American and Asian markets. The province has a well-defined potential for a wide variety of minerals and deposit types. The geoscience database is extensive and easily accessed and the provincial government is committed to aggressively improving that data and encouraging new developments. With attractive energy costs, a well developed, all-weather highway system, rail links and a number of deep-water ports, British Columbia has the infrastructure to cost-effectively get coal, minerals and resulting products to markets.

Mining is an important economic driver in British Columbia with 8 metal, 9 coal and approximately 32 major industrial minerals quarries and mines, numerous placer mines, and more than 1100 aggregate pits in operation during 2005. The **Mount Polley** copper-gold mine re-opened in early 2005. In addition, 5 projects were recently awarded Environmental Certificates for production, and another 18 applications for mines are being reviewed by the government. The **Trend** and **Wolverine – Perry Creek** coal projects in the northeast are scheduled to open in early and mid-2006, respectively.

During 2005, British Columbia benefited greatly from the international resurgence in mining, mine development and mineral exploration. Commodity prices for nearly all metals and coal rose substantially over the year, led particularly by gold, copper, molybdenum and coking coal. For example, gold reached a 24-year high of over $536US per ounce in early December. Mineral exploration expenditures increased for the sixth consecutive year and are estimated at $220 million for 2005, up about 70% from 2004 (Figure 1). Through Mineral Titles Online, new mineral tenure acquisitions reached a level of 4 810 000 hectares (equivalent to about 190 000 claim units), an increase of about 400% over the previous year (Figure 2). The 2005 statistics are estimates of the volume up to about mid-December, 2005. This is the sixth year in a row that there has been an increase in mineral tenure recording.

Both the *Mining Exploration Tax Credit Program* and *Exploration Investment Tax Credit* for flow-through investors, provide extra incentives to help attract risk capital to the province. *MapPlace*, the British Columbia government's internet geoscience information system, had approximately 6 million hits during 2005, reflecting the strong and renewed interest in mineral resource exploration and development.

Photo 1. Looking westerly over Wight Pit, Mount Polley copper-gold mine near Williams Lake.

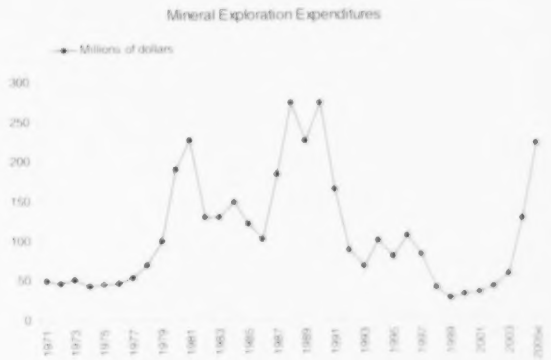

Figure 1. Mineral exploration expenditures (1971-2005).

MINING HIGHLIGHTS

British Columbia's operating mines in 2005 (Figure 3) are forecasting a total value of solid mineral production of $4.9 billion, an increase of 43% over 2004 (Figure 4). The province now ranks third in Canada by value of its mineral production. Coal (41%) is the single most important mineral commodity by value, and copper (24%) is second (Figure 5). Despite the increase in the value-of-production, the actual production decreased slightly for

copper, gold, silver and zinc. Molybdenum production increased 94% in value over 2004, to about $680 million. This large increase reflects a combination of much higher metal prices and increased production from the Endako, Huckleberry and Highland Valley Copper mines. Mine production and resources for 2005 are listed in Table 1.

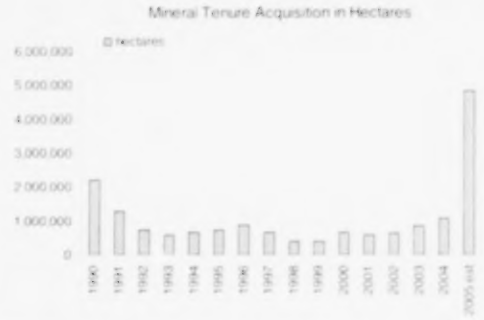

Figure 2. Mineral tenure acquisitions 1990 - 2005. Mineral Titles Online launched in January 2005 and the 2005 acquisitions of 4 810 000 hectares is equivalent to approximately 190 000 units under the old system (at approximately 23 hectares per unit).

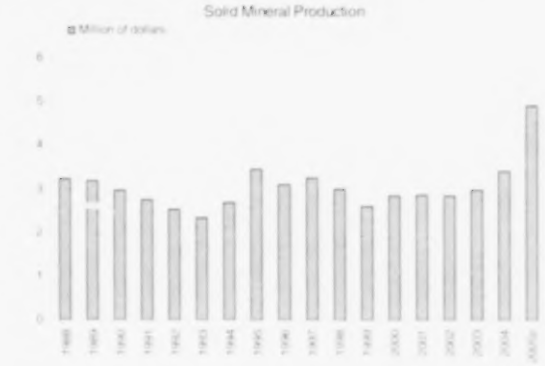

Figure 4. Solid mineral production value in British Columbia, 1988-2005.

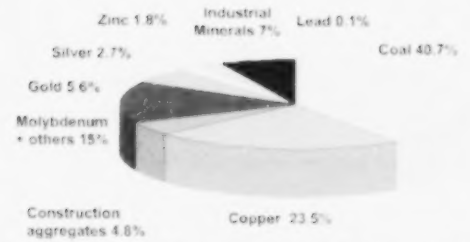

Figure 5. Forecast distribution of British Columbia mineral production by commodity – 2005.

Clean coal production for 2005 is expected to total 27.1 million tonnes, with a forecast value of approximately $2 billion. British Columbia has three major coal ports on the west coast - **Roberts Bank**, south of Vancouver, has a capacity of 26 million tonnes per year; **Neptune** terminals (Vancouver Port) has a capacity of 8 million tonnes per year and **Ridley Island** terminal, near Prince Rupert, has a capacity of 12 million tonnes per year. There was significant unused capacity, during 2005, for these coal ports. There is a fourth, deep water, ice-free port at Stewart, which may also benefit from increased exports.

British Columbia's industrial minerals production for 2005 (including sulphur) is estimated to be worth $340 million. The most economically significant industrial minerals in British Columbia are magnesite, white calcium carbonate, limestone, silica, dimension stone, gypsum, sulphur, construction aggregate, and crushed rock. Commodities produced in lesser quantities include jade (nephrite), magnetite, dolomite, barite, volcanic cinder, flagstone, industrial and medical/cosmetic clays, tufa, fuller's earth, bentonite, slag, mineral wool, roofing granules, graphite, and gemstones. There are at least 20 major sites throughout the province where upgrading of industrial minerals into value-added products takes place.

Structural materials production, including the important construction aggregate sector, is estimated to have a value of $235 million. There are aggregate operations throughout the province and they vary from large pits which supply the major metropolitan areas to many smaller pits used locally for road construction. Placer gold production and exploration in British Columbia was concentrated in the Atlin, Dease Lake, Manson Creek, Cariboo and Fort Steele areas, but the majority of the operations are small and seasonal in nature.

The provincial mining industry employed a direct workforce of more than 10 000 people province-wide and generated jobs for another 15 000 contractor and spin-off workers as well.

Northwest - Major Mines

The **Eskay Creek** underground gold-silver mine, operated by Barrick Gold Corporation, is expected to produce 5500 kg of gold and 290 000 kg of silver during 2005. It is the fifth largest silver producer in the world and among the richest in terms of value per tonne of ore. Current mine life is estimated to extend until 2007.

The **Endako** open-pit molybdenum mine, operated by Thompson Creek Mining Ltd. has operated for 35 years and is a low-cost producer. Production during 2005 is forecast at 4300 tonnes of molybdenum. As a result of very strong molybdenum prices, the company has embarked on a major pit expansion.

The **Huckleberry** open-pit copper-molybdenum mine, operated by Huckleberry Mines Ltd. produced ore from its East zone pit and shipped the concentrates through the port of Stewart to Japan. Production for 2005 is forecast at 34 000 tonnes of copper and 343 tonnes of molybdenum. A large exploration program focused on the Main Zone Extension. The company has identified additional resources that could add a couple more years to

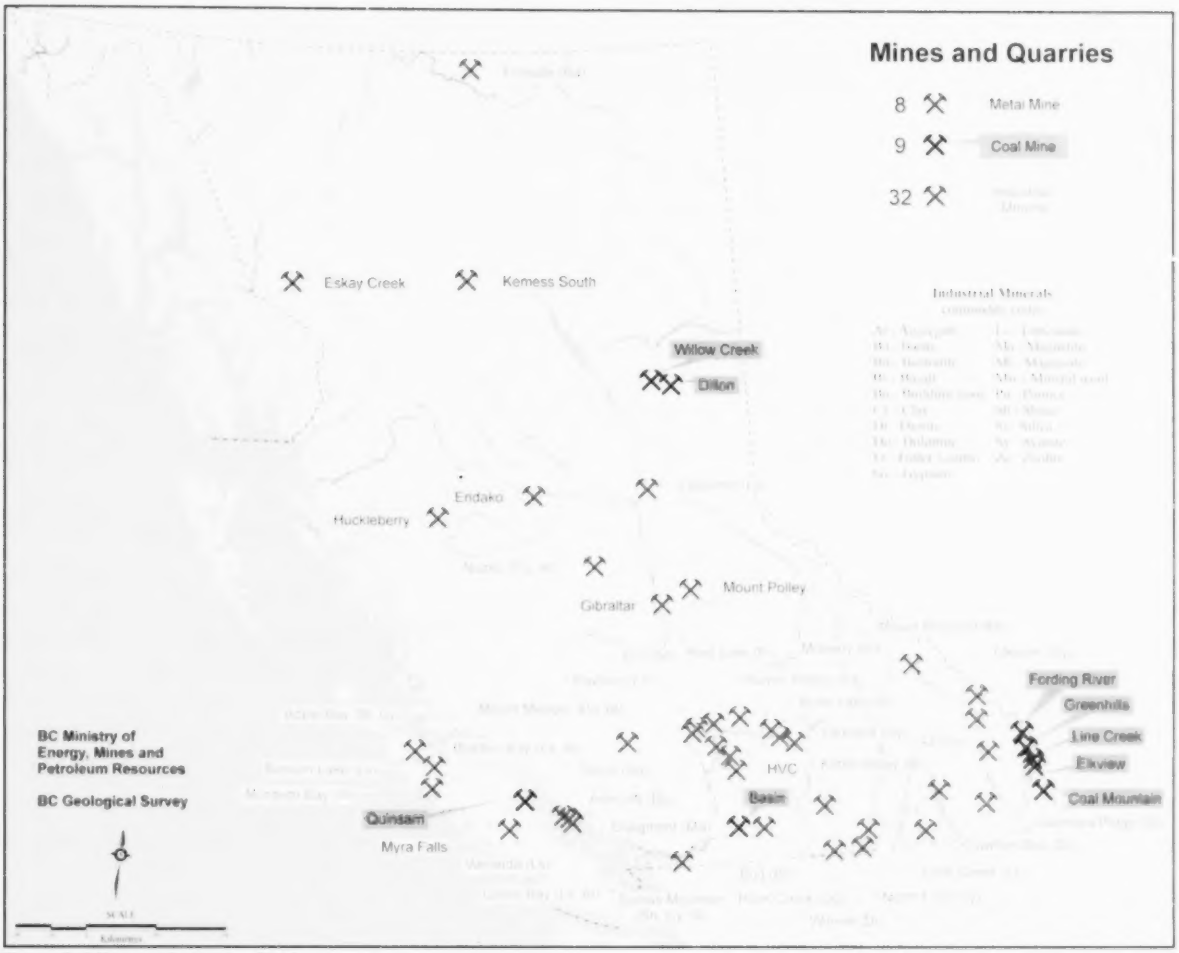

Figure 3. Mines and quarries 2005.

the mine life, currently estimated to be 2007; however, at this time it has decided not to proceed with the expansion.

Northeast - Major Mines

Pine Valley Mining Corp opened the **Willow Creek** coal mine, 45 km west of Chetwynd, in 2004. The company hopes to increase its daily throughput from 750 000 tonnes in 2005 to 1 to 1.5 million tonnes per year by 2006. Coal is crushed, screened and shipped raw as a pulverized coal injection (PCI) product used in steel making.

The **Burnt River - Dillon** open-pit coal mine of Western Canadian Coal Corporation, located 55 kilometres southwest of Chetwynd, began shipping PCI coal in December, 2004. In 2005, initial production is forecast at more than 700 000 tonnes of raw coal.

Central - Major Mines

The **Kemess South** open-pit mine, operated by Northgate Minerals Corporation, is expected to produce 8700 kg of gold, 33 100 tonnes of copper and 10 575 kg of silver during 2005. It is the largest gold producer in the province. Existing reserves will provide mill feed until 2009, but the mine life could be extended by more than ten years if the **Kemess North** deposit is put into production.

The **Gibraltar** open-pit mine, under a joint venture partnership between Taseko Mines Ltd and Ledcor Mining Ltd, reopened in October, 2004 and is forecast to produce 26 000 tonnes of copper and 225 tonnes of molybdenum during 2005. Taseko recently announced a 30% increase in the mineral reserves; the additional reserves increase the mine life to 15.5 years. The owners are also investigating the feasibility of reopening the solvent extraction-electrowinning leach plant, as well as constructing a hydrometallurgical plant onsite for longer-term operations.

TABLE 1. FORECAST MINE PRODUCTION 2005

Mine	Operator	Deposit Type / Commodity	Forecast Production in 2005 (tonnes or kilograms)	Proven and Probable Reserves (on Jan. 1, 2005)
Metals				
Endako	Thompson Creek Mining Ltd / Sojitz Moly Resources Inc	Calcalkalic porphyry Mo	4300 t Mo	74 000 000 t at 0.063% Mo (Oct. 1, 2005)
Eskay Creek	Barrick Gold Corp	Transitional Epithermal-VMS Au-Ag	5500 kg Au, 290 000 kg Ag	439 901 t at 36.3 g/t Au and 1632 g/t Ag
Highland Valley Copper	Teck Cominco Ltd / Highmont Mining Company Ltd	Calcalkalic porphyry Cu-Mo	172 000 t Cu, 3000 t Mo, 500 kg Au, 70 000 kg Ag	166 500 000 t at 0.43% Cu and 0.007% Mo (note: this figure is prior to the Sept. 2005 announcement of the revision of the mine plan and extension of the mine life to 2013.)
Gibraltar	Taseko Mines Ltd / Ledcor Mining Ltd	Calcalkalic porphyry Cu-Mo	26 000 t Cu, 225 t Mo	175 958 000 t @ 0.31% Cu and 0.01% Mo
Huckleberry	Imperial Metals Corp / Mitsubishi Material Corp / Dowa Mining Ltd / Furukawa Company Ltd / Marubeni Corp	Calcalkalic porphyry Cu-Mo	34 000 t Cu, 343 t Mo	19 435 000 t at 0.529% Cu, 0.015% Mo and 0.059 g/t Au
Kemess South	Kemess Mines Ltd (Northgate Minerals Corp)	Calcalkalic porphyry Au-Cu	8700 kg Au, 33 100 t Cu	91 700 000 t at 0.699 g/t Au & 0.227% Cu; Kemess North (Probable) 414 000 000 t at 0.31 g/t Au and 0.16% Cu
Mount Polley	Imperial Metals Corp	Alkalic porphyry Cu-Au-Ag	14 000 t Cu, 1060 kg Au, 6660 kg Ag	44 000 000 t at 0.45 % Cu & 0.30 g/t Au
Myra Falls	NVI Mining Ltd (Breakwater Resources Ltd)	Zn-Cu-Au-Ag	50 000 t Zn, 7900 t Cu, 974 kg Au, 36 400 kg Ag	4.914 M t at 8.66% Zn, 1.47% Cu, 1.76 g/t Au, 63.78 g/t Ag (M and I)
Shasta	Sable Resources Ltd	Epithermal vein Au-Ag	15.2 kg Au, 321 kg Ag cut off	
Coal				
Basin (Tulameen)	Compliance Energy Corp	Thermal coal	75 000 t	
Coal Mountain	Elk Valley Coal Partnership	Metallugical coal	2 350 000 t	28 000 000 t
Dillon	Western Canadian Coal Corp	Metallurgical (PCI) coal	700 000 t	1 370 000 t
Elkview	Elk Valley Coal Partnership	Metallugical coal	6 000 000 t	249 000 000 t
Fording River	Elk Valley Coal Partnership	Metallugical coal	9 300 000 t	257 000 000 t
Greenhills	Elk Valley Coal Partnership	Metallugical coal	5 100 000 t	98 000 000 t
Line Creek	Elk Valley Coal Partnership	Metallugical and thermal coal	2 500 000 t (including 300 000 t thermal)	20 000 000 t
Quinsam	Quinsam Coal Corp (Hillsborough Resources Ltd)	Thermal & PCI coal	532 000 t clean coal	11 years of production
Willow Creek	Pine Valley Mining Corp	Metallurgical (PCI) coal	750 000 t	12 300 000 t saleable

Industrial Minerals

Mine	Operator	Deposit Type / Commodity	Mine	Operator	Deposit Type / Commodity
4J	Georgia-Pacific Canada Inc	Gypsum	Kettle Valley quarries	Kettle Valley Stone Company	Ashlar, flagstone, thin veneer
Apple Bay	Electra Gold Ltd	Geyserite	Lime Creek	Imasco Minerals Inc	Limestone
Ashcroft	IG Machine and Fiber Ltd (IKO Industries Ltd)	Basalt roofing granules	Moberly	Heemskirk Canada	Silica sandstone
Benson Lake	Imasco Minerals Inc	Limestone	Monteith Bay	Lehigh Northwest Cement Ltd	Geyserite
Blubber Bay	Ash Grove Cement Corp	Limestone aggregate, dolomitic lst	Mount Brussilof	Baymag Inc	Magnesite
Bud	Western Industrial Clay Products Ltd	Bentonite	Mount Meager	Great Pacific Pumice Inc	Pumice
Buse Lake	Lafarge Canada Inc	Volcanic ash (alumina-silica)	Nazko	Canada Pumice Corp	Lava rock
Craigmont	Craigmont Mines Joint Venture	Magnetite tailings	North Fork	Roxul (West) Inc	Syenite (mineral wool)
Crawford Bay	Imasco Minerals Inc	Dolomite	Pavilion	Graymont Western Canada Inc	Limestone
Decor	Pacific Bentonite Ltd	Burnt shale (alumina and landscape rock)	Red Lake	Western Industrial Clay Products Ltd	Diatomaceous earth, leonardite
Elkhorn	BPB Canada Inc	Gypsum	Rock Creek	Mighty White Dolomite Ltd	Dolomite
Falkland	Lafarge Canada Inc	Gypsum	Sumas Mountain	Claybum Industries Ltd and cement manufacturer partners	Clay, shale and sandstone
Fireside	Fireside Minerals Inc	Barite	Swansea Ridge	Canadian Pacific Railway	Diorite (mineral wool)
Gillies Bay	Texada Quarrying Ltd (Lafarge Canada Inc)	Limestone, aggregate	Vananda	Imperial Limestone Company Ltd	Limestone
Giscome	Canadian National Railway Company	Basalt (railroad ballast)	Winner	Roxul (West) Inc	Diorite (mineral wool)
Harper Ranch	Lafarge Canada Inc	Limestone	Z-z	Industrial Minerals Processors	Zeolite

The **Mount Polley** open-pit mine, operated by Imperial Metals Corporation, reopened in early 2005, and is forecast to produce 14 000 tonnes of copper, 1060 kilograms of gold and 6660 kg of silver during the year. Mine life is projected to 2011, with approximately 230 employees. The company also conducted a large, property-wide exploration program, including 40 000 metres of diamond drilling. Several new, potentially significant zones of copper-gold mineralization were intersected. Drilling below the Wight pit on the Northeast zone, intersected 25.1 metres grading 4.43% Cu, 1.28 g/t Au and 26.96 g/t Ag. Imperial is also examining the potential for underground mining.

The **Nazko** lava rock quarry near Quesnel, operated by Canada Pumice Corporation, doubled its production level over the past few years.

Kootenays - Major Mines

Elk Valley Coal Corporation in southeastern British Columbia operates 5 coking coal mines, **Fording River, Greenhills, Line Creek, Elkview** and **Coal Mountain** providing it with flexibility to blend coals from different mines to meet customer needs. The company expects to produce about 25.3 million tonnes in 2005. The Corporation, 62% owned by Fording Canadian Coal Trust and 38% by Teck Cominco Limited, is the world's second-largest supplier of metallurgical coal. In 2005, Elk Valley Coal Corporation signed letters of intent with two of the world's largest steelmakers, Japan's Nippon and South Korea's Posco.

Photo 2. Line Creek coal mine, Elk Valley.

During 2005, production of 65 000 tonnes of silica by Heemskirk Canada, was forecast from the **Mt. Moberly** mine, located near Golden. Northeast of Radium Hot Springs, Baymag Inc produces high-quality magnesite from its **Mount Brussilof** open-pit mine. Production in 2005 was projected to be 180 000 tonnes.

Further south, BPB Canada Inc operates the **Elkhorn** gypsum mine, east of Windermere, and Georgia-Pacific Canada Inc produces gypsum from the **Four J** mine, southeast of Canal flats. Production at the Elkhorn and Four J mines for 2005 was projected to be approximately 550 000 and 275 000 tonnes, respectively. Imasco Minerals Inc produces a variety of crushed and ground rock products at its Creston Operations plant near Sirdar. These products are derived from rock from an underground dolomite mine at **Crawford Bay**, a limestone quarry at **Lime Creek** east of Salmo and a granite quarry at Sirdar. Mighty White Dolomite Ltd produces a range of crushed and ground dolomite products from its quarry and plant at **Rock Creek**. The **Winner** and **North Fork** quarries, west and north of Grand Forks, respectively, ship diorite and syenite-monzonite, respectively to the Roxul (West) Inc mineral wool manufacturing plant in Grand Forks.

Crystal Graphite Corporation produces and ships high-purity flake graphite from its **Black Crystal** property and mill, west of the Slocan valley.

South-Central - Major Mines

The **Highland Valley Copper** open-pit mine near Kamloops, operated by Teck Cominco Ltd and Highmont Mining Company, is Canada's largest base metal mine. It is the fifth largest open pit mining operation in the world, with a daily mill throughput averaging 136 000 tonnes of rock. Production in 2005 is expected to be 172 000 tonnes of copper, 3000 tonnes of molybdenum and minor byproduct gold and silver. In September 2005, it was announced that the mine life would be extended another five years to 2013. Teck Cominco is also considering building a modern hydrometallurgical smelter on site. Mining in the **Highmont East** pit re-commenced in late 2005.

Compliance Energy Corporation mined about 75 000 tonnes of thermal coal from its **Basin** property, near Tulameen. A wash plant, formerly at the Similco site, was moved to the Basin site.

Over 250 people are employed at industrial mines quarries and processing plants in the South-Central region. The **Kamloops** cement plant and **Harper Ranch** limestone quarry of Lafarge Canada Inc were expected to operate close to capacity in 2005. Near Cache Creek, Graymont Western Canada Inc operates the **Pavilion** limestone quarry and lime plant. Employing mainly First Nations workers, the operation produces lime used in pulp mills, mines and other industrial processes. The **Ashcroft** basalt quarry and roofing granule plant east of Ashcroft, operated by IG Machine and Fiber Ltd, produces about 250 000 tonnes of roofing granules in six distinct colours. Craigmont Mines Ltd processes and recovers about 70 000 tonnes of magnetite annually from its **Craigmont** tailings operation near Merritt. The magnetite is used in most coal washing plants in western Canada.

Western Industrial Clay Products Ltd manufactures a variety of products at its plant in Kamloops, using raw materials from its **Red Lake** diatomaceous earth quarry

northwest of Kamloops and its **Bud** bentonite quarry at Princeton. Zeolite was mined from Industrial Mineral Processors' **Z2** quarry near Cache creek and processed at a plant in Ashcroft. At Princeton, Zeo-Tech Enviro Corporation processed zeolite from its **Zeo** quarry. Okanagan Opal Inc produces attractive fire opal gemstones and jewelry from its **Klinker** property, west of Vernon. Decorative rock and dimension stone are produced at numerous small quarries throughout the region (*e.g.* **Nipple Mountain** and **Begbie** quarries) by small companies, including Kettle Valley Stone Company in Kelowna.

Southwest - Major Mines

The **Myra Falls** underground mine west of Campbell River, operated by NVI Mining Ltd, a subsidiary of Breakwater Resources Ltd, has been in operation since 1966. Just over 900 000 tonnes of ore were estimated to be processed during 2005 in the mill, producing copper, zinc-silver and gold concentrates. The company continues to optimize its mining plan and is considering the addition of a lead circuit. In 2005, the company conducted exploration along the Marshall trend and in the Extension, 43 Block and HW zones.

The largest limestone production center in the province is **Texada Island**, where three quarries, **Gillies Bay**, **Blubber Bay** and **Vananda** are forecast to ship close to 6 million tonnes in 2005. White calcium carbonate is produced from **Gillies Bay** and also from the **Benson Lake** quarry on northern Vancouver Island. **Texada Island** limestone producers are capitalizing in the rapidly expanding market for crushed rock, the natural byproduct of their limestone operations. Lehigh Northwest Cement Limited ships aggregate from its facility at **Sechelt** to the San Francisco Bay area. Nineteen large aggregate quarries and pits in the Lower Mainland and coastal area are forecast to produce about 17 million tonnes in total in 2005.

Clayburn Industries Ltd processes clay from its **Sumas Mountain** operation and Clayburn, Lafarge Canada Inc and Lehigh Northwest Cement Ltd produce shale and sandstone from their **Sumas** quarry. Ironwood Clay Company Inc produces cosmetic/medical clay seasonally from its **De Cosmos Lagoon** quarry on Hunter Island, west of Bella Coola.

Westcoast Granite Manufacturing Inc, Margranite Industries and Matrix Marble Corporation operate stone-processing plants. Dimension stone is quarried from several locations, including **Skagit Valley**, **Whistler**, **Tahsis**, **Hardy Island**, **Fox Island**, **Gordon River**, **Hisnet Inlet** and **Haddington Island**. Great Pacific Pumice Ltd ships a variety of pumice-based products from its **Pum** property on Mount Meager, north of Pemberton.

Photo 3. Cox Station quarry loadout along the Fraser River, Lower Mainland.

Electra Gold shipped approximately 120 000 tonnes of chalky geyserite (silica and alumina) from its **Apple Bay** property, west of Port Hardy, to supply cement plants in Vancouver and Seattle. On western Vancouver Island, Lehigh Northwest Cement produced 29 500 tonnes of silica-alumina product from its quarry at **Monteith Bay**.

Hillsborough Resources is forecast to produce from 532 000 tonnes from its **Quinsam** thermal coal mine on Vancouver Island. A modest exploration drilling program was conducted at the Quinsam mine.

MAJOR DEVELOPMENT PROJECTS

Northwest - Major Development Projects

During 2005, Redcorp Ventures received federal environmental approval in addition to its BC Environmental Assessment Certificate for its **Tulsequah Chief** project, south of Atlin. East of Atlin, Adanac Moly Corporation filed its **Ruby Creek** molybdenum project report to the BC Environmental Assessment Office (EAO), for a proposed 20 000 tonnes per day milling operation for over 20 years. A final feasibility study was expected by year's end. East of Dease Lake, Western Keltic Mines completed another large drilling program and metallurgical testing aimed at further evaluating its **Kutcho Creek** deposits for possible open pit exploitation of the higher-grade core, along with the adjacent Esso West deposit. Results from the current metallurgical program show a marked improvement in both copper recovery and concentrate grade compared with earlier work. A feasibility study was initiated in 2005 and a project report was submitted to the BC Environmental Assessment Office. At its **Mount Klappan** anthracite coal property, 75 kilometres southeast of Dease Lake, Fortune Minerals Limited carried out drilling to enhance resources and collect engineering and environmental data

necessary for mine development of a 1.5 to 3 million tonnes per year operation.

In August 2005, bcMetals received an Environmental Certificate for its **Red Chris** copper-gold project, east of Iskut. Its feasibility study identifies the potential for a 30 000 tonnes per day milling operation, producing 47 200 tonnes of copper and 2208 kilograms of gold annually, over a mine life of 25 years.

The largest exploration program in the province, with $50 million in expenditures and a 200 – person, fly-in camp, was at the **Galore Creek** gold-copper-silver project, located southwest of Dease Lake. Utilizing ten drill rigs, NovaGold Resources expanded the previously identified resources and discovered additional zones of mineralization. An economic assessment of the project in early 2005 indicated the potential for a 65 000 tonnes per day milling operation for over 20 years. The company plans to submit its project report to the BC Environmental Assessment Office in early 2006.

Photo 4. Looking northerly over 200-person exploration camp, Galore Creek.

Photo 5. Looking southwesterly over the Davidson molybdenum property on Hudson Bay Mountain, near Smithers.

Near Stewart, development projects for aggregate include **Bear River** and **Swamp Point**.

In the Babine camp, Pacific Booker Minerals continued to study the feasibility of advancing its **Morrison/Hearne Hill** copper-gold project to production. At Smithers, Blue Pearl Mining is developing its **Davidson** (formerly Yorke-Hardy) molybdenum deposit. Underground drilling from an existing adit was initiated in late 2005. The company is evaluating the potential for a 2000 tonnes per day high-grade, underground mine, with processing being done offsite either at the Endako or Huckleberry mines. A feasibility study is expected in mid-2006.

Northeast - Major Development Projects

The Burnt River coal property includes the nearby 30-million tonne **Brule** deposit owned by Western Canadian Coal Corporation. The company applied for an Environmental Assessment Certificate for this deposit in 2005, in preparation for mine development in 2006. It also continued exploration on its **Wolverine - Perry Creek** deposit, about 20 kilometres west of Tumbler Ridge; production is scheduled for mid-2006. Northern Energy and Mining Inc (NEMI) completed construction on its **Trend** property, 25 kilometres south of Tumbler Ridge and prepared for commercial production in early 2006. It continued exploration on its Trend-Roman Mountain deposit.

Photo 6. The Trend coal mine is scheduled for production in early 2006.

Central - Major Development Projects

Northgate Minerals' **Kemess North** project, near its Kemess South mine, is being reviewed by a joint federal and provincial panel. If approved, the combined operations of the mine and the Kemess North deposit could extend the mine life to 2020. During 2005, a large

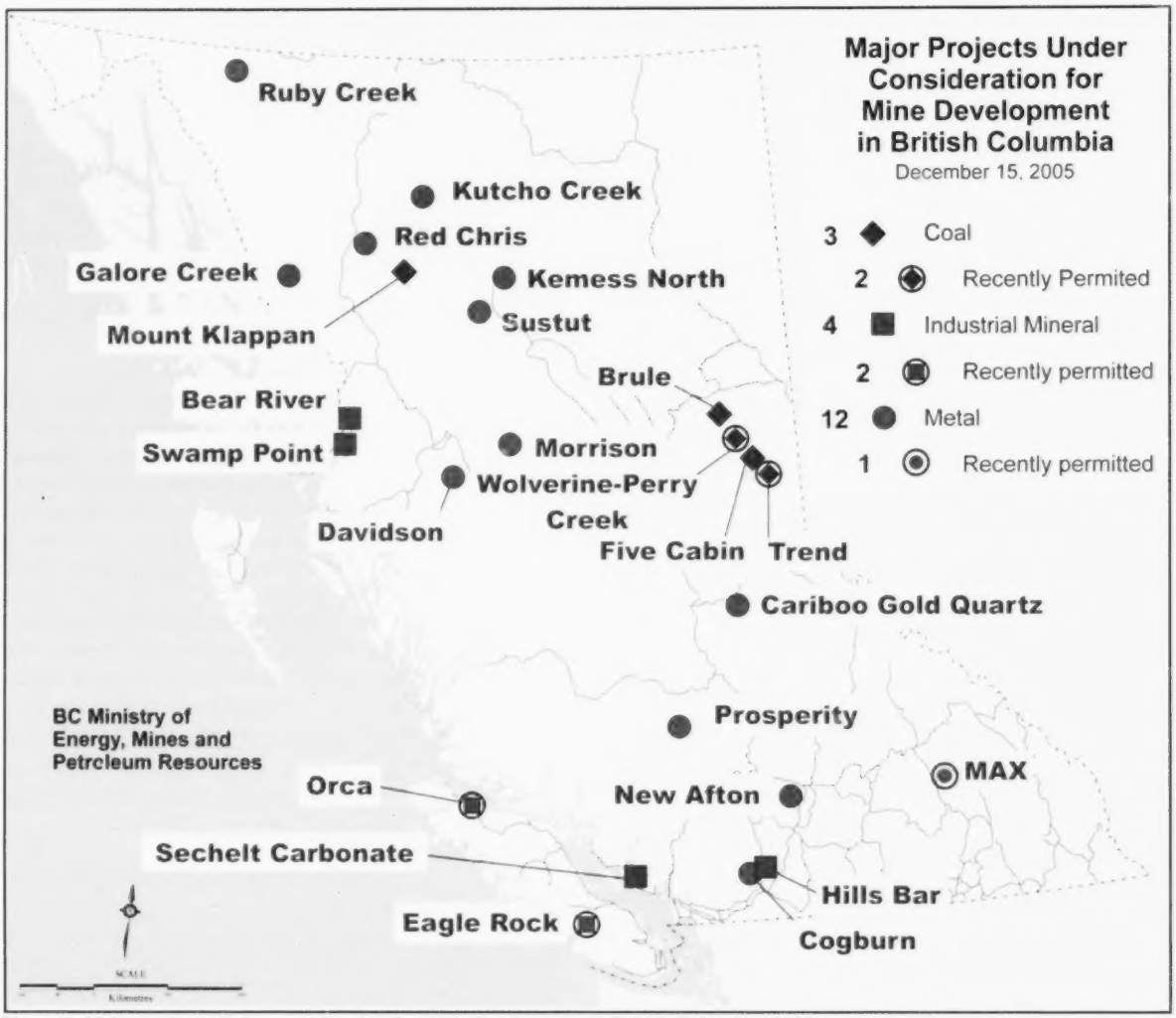

Figure 6. Major projects under consideration for mine development in British Columbia, 2005.

deep drilling program at the eastern end of the large system resulted in the discovery of additional potentially significant mineralization.

Cross Lake Minerals is expected to announce the reopening of its **QR** gold mine, east of Quesnel, in 2006. It continued to drill for additional resources, especially in the North zone.

Placer Dome reevaluated its **Mt. Milligan** gold-copper project, west of Mackenzie. It plans to release the results of its recently updated feasibility study in early 2006.

South-Central - Major Development Projects

Taseko Mines Limited reinitiated work on its **Prosperity** copper-gold project, southwest of Williams Lake, after receiving an extension for its Project Application under the Environmental Assessment process until April 30, 2007. Current resources are estimated at 490.8 million tonnes grading 0.22% Cu and 0.43 g/t Au.

The historic **Bralorne** gold mine near Goldbridge was the focus of considerable underground development and drilling, in addition to a small amount of test milling.

In the Kamloops region, New Gold Inc completed a major underground exploration program on its **New Afton** copper-gold-silver deposit. The deposit sits directly beneath an open pit that produced from 1977 to 1987. It is a higher-grade zone that would have to be mined from underground, if proven to be economically feasible. Samples for metallurgical testing and geotechnical analyses were collected. Several higher-grade drill intersections than indicated by the current resource model were encountered. A feasibility study is expected in late 2006.

TABLE 2. MAJOR PROJECTS UNDER CONSIDERATION FOR MINE DEVELOPMENT IN BRITISH COLUMBIA, 2005

Project Name	Owner/Operator	Commodities
Bear River	Beacon Ventures Inc	Aggregate
Brule	Western Canadian Coal Corp	Coal
Cariboo Gold Quartz	International Wayside Gold	Au
Cogburn	North Pacific Alloys Ltd	Mg
Davidson	Blue Pearl Mining Ltd	Mo
Eagle Rock	Eagle Rock Materials Ltd	Aggregate
Five Cabin	Hillsborough Resources Limited	Coal
Galore Creek	NovaGold Resources Inc	Cu-Au-Ag
Hills Bar	Qualark Resources Inc	Aggregate
Kemess North	Northgate Minerals Corp	Au-Cu
Kutcho Creek	Western Keltic Mines Inc	Cu-Zn-Au-Ag
MAX	Roca Mines Inc	Mo
Morrison/Hearne Hill	Pacific Booker Minerals Inc	Cu-Au
Mount Klappan	Fortune Minerals Ltd	Coal
New Afton	New Gold Inc	Cu-Au
Orca	Polaris Minerals Ltd	Aggregate
Prosperity	Taseko Mines Ltd	Au-Cu
Red Chris	bcMetals Corp	Au-Cu
Ruby Creek	Adanac Moly Corp	Mo
Sustut	Doublestar Resources Ltd	Cu-Ag
Swamp Point	Ascot Resources Ltd	Aggregate
Sechelt Carbonate	Pan Pacific Aggregates Ltd	Limestone/dolomite
Trend	Northern Energy and Mining Inc	Coal
Wolverine-Perry Creek	Western Canadian Coal Corp	Coal

Photo 7. Looking southwesterly over the New Afton open pit that is currently being explored for the potential to become an underground mine.

Highland Valley Copper collected a 300 000-tonne bulk sample and began commercial-scale mining from its dormant **Highmont East** pit to take advantage of high molybdenum prices. In addition, drilling in the nearby **Highmont South** area was conducted to evaluate the potential for developing a new pit.

Southeast – Major Development Projects

In November 2005 Roca Mines Inc received a mining permit for its high-grade (260 000 tonnes grading 1.95% MoS_2), underground **MAX** molybdenum project near Trout Lake, southeast of Revelstoke. The company plans to fast track initial development of a 250 tonnes per day milling operation, processing 72 000 tonnes of ore per year for the first three years. Production is forecast in late 2006, with the concentrate being sold on site.

Near Greenwood, Merit Mining continued drill testing of its **Lexington** (Grenoble) gold-copper deposit. In 2006, it plans on collecting a 10 000-tonne bulk

sample, followed by limited production from its Zip mill which will be built nearby.

Photo 8. Portal area at the MAX molybdenum site being readied for production in late 2006.

Southwest - Major Development Projects

In recent years, the most significant industrial minerals trend in British Columbia has been an increasing export of crushed stone and natural aggregate to urban centres along the west coast of the United States and higher sales within British Columbia's Lower Mainland. These markets continue to be very competitive as industry identifies new potential for development. A good example of this is the recently permitted, $100-million construction aggregate complex (**Eagle Rock Quarry**) and ship-loading facility, near Port Alberni. Other significant development projects include the recently permitted **Orca** sand and gravel near Port McNeil and **Hills Bar** aggregate near Yale. The **Sechelt Carbonate** project is a proposed limestone/dolomite development with annual production forecast at 4 to 6 million tonnes over a 25-year mine life.

MINERAL EXPLORATION

There were approximately 200 exploration projects in British Columbia with budgets in excess of $100 000 (selected projects listed in Table 3 and shown in Figure 7), up 19% from 2004. This includes 43 projects with expenditures in excess of $1 million, up 43% from 2004. The number of drilling programs and the total metres drilled rose significantly, with about 235 projects aggregating approximately 660 000 metres, up 38% and 27% respectively from 2004. Approximately 82% of exploration spending was on advanced projects, while there were very few grassroots programs (Figure 8). The targets sought, by deposit type, are shown in Figure 9. Thirty-five bulk sample and/or metallurgical testing programs were completed in 2005, including **Bear Coal**, **Belcourt**, **Bralorne**, **Five Cabin**, **Highmont East**, **MAX**, **New Afton**, **Saxon**, **Schaft Creek** and **Turnagain**.

Coal tenure acquisitions increased dramatically in 2005, fueled by the high coal prices, particularly in the northeast. Provincial exploration expenditures for coal increased sixfold to $40 million in 2005. Twenty-eight drilling projects with an aggregate of approximately 110 000 metres were completed. Exploration expenditures on industrial minerals projects are estimated at $3.8 million.

At least 28 new mineral discoveries were reported in 2005 (Figure 10).

Figure 8. Exploration expenditures by type of program – 2005.

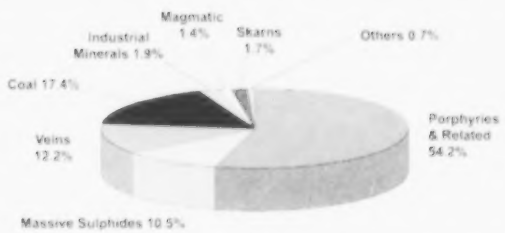

Figure 9. Percentage of project expenditures, focused on specific deposit types in 2005.

Northwest - Major Exploration Projects

In the Atlin region, Prize Mining Corp drilled along the Pine Creek fault structure on its **Yellowjacket** gold project. Across the Tulsequah River from the Tulsequah Chief property, Canarc Resources continued infill drilling on the C vein system at its **New Polaris** gold project. The C vein flattens below the deepest level of the mine; high-grade intersections were reported over broad widths.

Southwest of Atlin, Cangold Limited and Rimfire Minerals drilled the Talisker polymetallic zone, as well as several other untested anomalies on their **Thorn** property. Barrick Gold Corp conducted a large regional reconnaissance exploration program (**Kizmet**) from the Thorn area northwestwards towards the Taku River in the search for high-sulphidation epithermal gold targets.

Drilling by Cusac Gold Mines at its **Taurus II** bulk tonnage disseminated gold prospect, in the Cassiar region, resulted in defining new zones of mineralization, adjacent to the main **Taurus** gold prospect owned by American Bonanza Gold Corp. Hard Creek Nickel Mines continued drilling on its **Turnagain** nickel-

copper-platinum group elements property, west of Dease Lake. Disseminated pyrrhotite and pentlandite occur within dunite and wehrlite in the Horsetrail zone. Positive results are expected to increase the resources in this zone and a preliminary economic assessment of the project is scheduled for mid-2006. Metallurgical testing is ongoing.

Firesteel Resources continued drill testing and trenching on the DK prospect on its **Copper Creek** porphyry copper-gold property. Canadian Gold Hunter extended the strike length of its copper-gold mineralization to over 1500 m on its Donnelly zone at its **Kinaskan (GJ)** project, west of Iskut. The western-most drill hole returned 46.95m grading 0.832% Cu and 1.31 g/t Au, within 130.95m grading 0.44% Cu and 0.647 g/t Au.

Copper Fox Metals drilled its **Schaft Creek** copper-molybdenum-gold-silver deposit to verify previous resources estimated at 847 million tonnes grading 0.292% Cu, 0.019% Mos., 0.202 g/t Au and 1.8 g/t Ag, and for metallurgical testing. It has commenced the EA process, which includes a preliminary review of possible access routes to Highway 37.

Photo 9. Looking easterly over Schaft Creek.

On the **Foremore** property, west of Bob Quinn Lake, Roca Mines drill tested its Kuroko-style massive sulphide target. Northgate Minerals, under an option agreement with Rimfire Minerals, drilled the **RDN** Eskay Creek type target. Drilling on the Arctic Grid confirmed the prospective rock assemblage extends for at least five kilometres.

Falconbridge Ltd carried out drilling on four priority targets (Iron Cap, Main Copper, West Mitchell and Icefields), which lie outside the known resources on the **Kerr-Sulphurets** porphyry copper-gold project.

North of Stewart, Tenajon Resources reported significant results from its underground and surface drilling program on its **Summit Lake (Scottie Gold)** gold mine. Serengeti Resources and Rimfire Minerals reported additional drill results from their **Tide** bulk tonnage gold prospect. Drilling by Bell Resources beneath the South Leduc glacier on its **Granduc** property located a 244-metre southward and 244-metre downdip extension of the former ore zones. Pinnacle Mines conducted a large drilling program on its **Silver Coin** gold-silver-zinc-lead project, which adjoins the historic Premier mine on the west. It has outlined mineralization over a strike length of 2000 metres, a vertical height of 700 metres and widths of 10 to 100 metres in the Main Breccia zone. South of Stewart, Ascot Resources is exploring a significant sand and gravel deposit at **Swamp Point**. It has applied for a mine development permit. Sabina Resources, under an option agreement with Teuton Resources, continued drill testing of its mesothermal LG gold-silver vein system on the **Del Norte** property, south of Stewart. North of Alice Arm, Tenajon Resources drilled its **Ajax** molybdenum deposit to test the previously identified resource of 178.5 million tonnes grading 0.07% Mo. The drilling also extended the mineralization and increased the grades at depth.

South of Houston, Gold Reach Resources discovered potentially significant porphyry copper-gold-molybdenum mineralization at its **Seel** property. Aumega Discoveries drilled the **Poplar** deposit, where previous resources were estimated at 144 117 000 tonnes grading 0.368% Cu, 0.011% Mo, 6.86 g/t Ag, plus gold. Manson Creek Resources reported a new zone (Burn) of porphyry copper-molybdenum mineralization on its **CR** property. New Cantech Ventures completed a large drilling program on its **Lucky Ship** molybdenum deposit. It is targeting an initial 5-million tonne resource, within a previously reported resource of 18.4 million tonnes grading 0.098% Mo.

Northeast - Major Exploration Projects

Coal exploration spending on Peace River coalfields on 20 projects totalled approximately $27 million and included approximately 94 000 metres of drilling. The deposits lie within a 400-kilometre northwesterly trending belt extending from the Alberta-British Columbia border past Hudson's Hope. When developed, the coal from these properties will be exported for use in the steel-making industry. Western Canadian Coal Corporation and NEMI joined forces in 2005 to explore and develop the **Saxon** and **Belcourt** coal projects near Tumbler Ridge. Both properties have had feasibility reports prepared in the past but were never developed. The mines would need approximately 100 kilometres of rail extension to connect to the existing CN line. Major exploration programs, most including drilling, were completed on the following projects: **Belcourt North** (Western Canadian Coal/NEMI), **Belcourt South** (Western Canadian Coal/NEMI), **Falling Creek** (Kennecott), **Five Cabin** (Hillsborough), **Goodrich-Central South** (First Coal Corp), **Lossan** (Cline Mining), **Omega** (Western

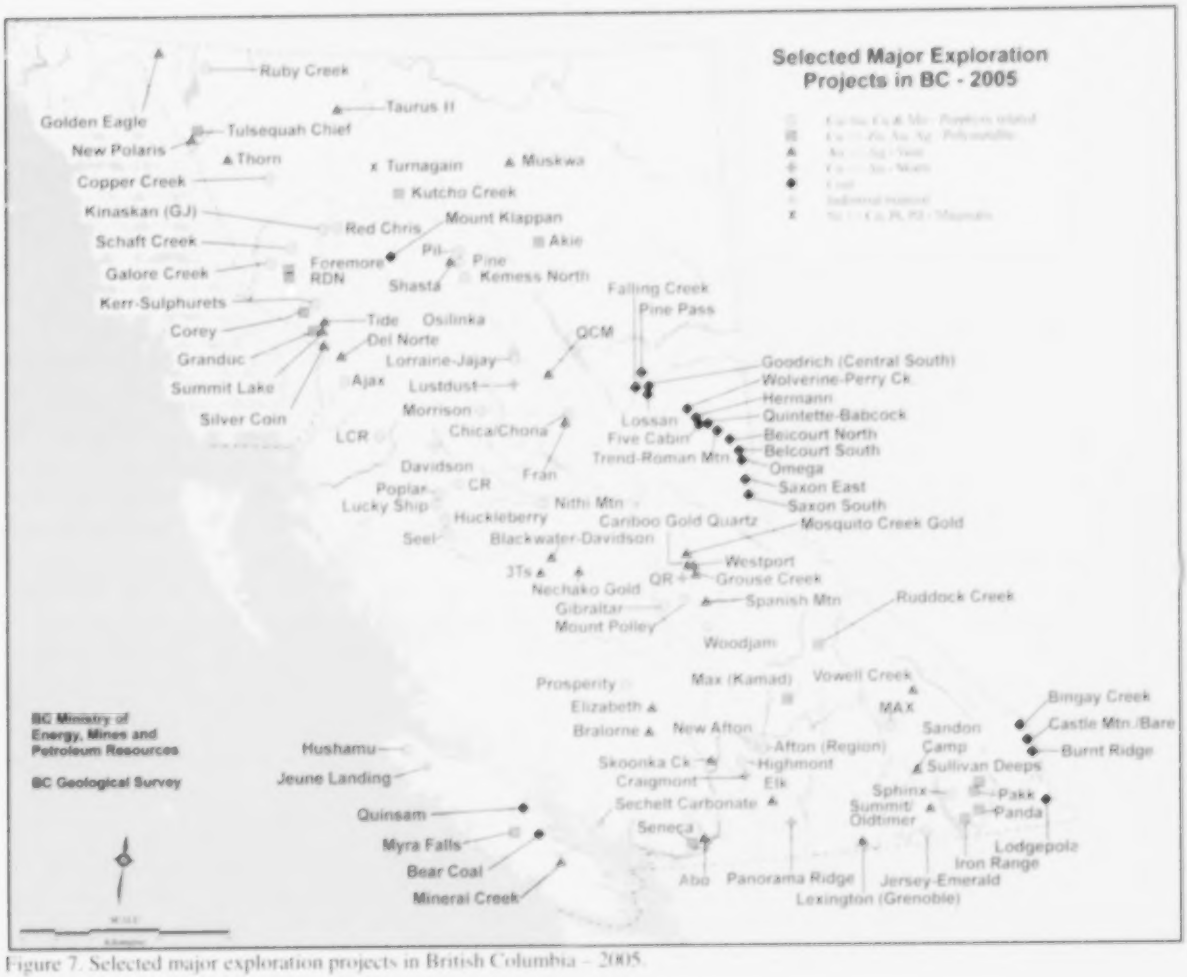

Figure 7. Selected major exploration projects in British Columbia – 2005.

Canadian Coal/NEMI), **Pine Pass** (Falls Mountain Coal), **Quintette-Babcock Mountain** (Elk Valley Coal), **Saxon East** and **Saxon West** (Belcourt Saxon Coal Limited), **Trend-Roman Mountain** (NEMI), **Wolverine-Hermann North** (Western Canadian Coal) and **Wolverine-Perry Creek** (Western Canadian Coal). Many of these have existing resources; some will be announcing new and/or revised resources in 2006.

Exploration was reactivated in the Gataga sedex belt by Mantle Resources, under an option agreement with Ecstall Resources, on the **Akie** zinc-lead-silver property. A late season drilling program yielded encouraging results (e.g. 37.05 metres grading 11.30% Zn, 2.65% Pb and 21.2 g/t Ag, including 17.93 metres grading 18.08% Zn, 4.20% Pb and 30.1 g/t Ag). Near the British Columbia-Yukon border, south of Toad River, Twenty Seven Capital explored the **Muskwa** iron oxide copper gold target.

Central - Major Exploration Projects

In the Toodoggone region, Northgate Minerals drilled several properties peripheral to its Kemess South mine. At its **Kemess North** project, 7 kilometres to the north, the company discovered additional, potentially significant gold-copper mineralization at the east end of the large system. The project is currently being reviewed by a joint federal-provincial panel; a decision is expected in 2006. In late 2005, Stealth Minerals announced an option agreement with Placer Dome on its **Sickle Creek** high-sulphidation epithermal gold-silver property. Finlay Minerals and Cascadero Copper drilled porphyry and vein targets on their **Pil North** and **Pine** properties, respectively. Drilling by Bishop Gold on the southern Cliff Creek zone on its **Lawyers** gold-silver property outlined the southern end of a quartz breccia zone from 65 to 80 metres in width.

Alpha Gold drilled its large **Lustdust** skarn gold-copper property, northwest of Fort St. James. Teck

TABLE 3. SELECTED MAJOR EXPLORATION PROJECTS IN BRITISH COLUMBIA IN 2005

Property	Operator	Minfile (NTS)	Commodity	Deposit Type	Work Program	Region
3Ts	Southern Rio Resources Ltd	093F 055, 068	Au-Ag	Epithermal Vein	A, P, G, GC, DD	C
Atlin	Eagle Plains Resources Ltd	095HSW092	Au-Ag-Zn-Cu	Vein	DD (3068 m)	SW
Ajax	Taseko Resources Corp	103P 223	Mo	Porphyry	DD (1165 m; 3 holes)	NW
Ajax (Abacus)	Abacus Mining and Exploration Corp / Teck Cominco Ltd	92INE012, 013	Cu, Au	Alkalic Porphyry	DD (~2440 m; 5 holes)	SC
Akie	Mantle Resources Ltd	094F 031	Zn-Pb-Ag	Sed-Ex	DD (2000 m; 3 holes)	C
Basin (Tulameen) Coal	Compliance Energy Corp	092HSE 094, 157	Thermal Coal	Sedimentary	DD (~1320 m; 3 holes)	SC
Bear Coal	Compliance Energy Corp	092F 313	Coal	Sedimentary	G, TR, RD/DD(1550 m; 33 holes)	SW
Belcourt North	Belcourt Saxon Coal Limited Partnership	093I 014	Coking Coal	Sedimentary	A, G, RD & DD (~9550 m; 42 holes); GP, CQ, PF	NE
Belcourt South	Belcourt Saxon Coal Limited Partnership	093I 014	Coking Coal	Sedimentary	A, G, RD & DD (4313 m; 43 holes); GP, CQ, PF	NE
Bingay Creek	Hillsborough Resources Ltd	082JSE011	Metallurgical coal	Sedimentary	EN, RC (1371 m)	SE
Blackwater-Davidson	Southern Rio Resources Ltd	093F 037	Au-Ag	Epithermal Vein	A, DD (939 m; 5 holes)	C
Bralorne (Cosmopolitan, Peter Vein, 51B Vein)	Bralorne Gold Mines Ltd	92JNE164, 001	Au, Ag	Mesothermal Vein	DD (~5000 m); UG (~1070 m); UG-BS (~3200 t); test milling (~21,000 t)	SC
Broken Hill	Timet Explorations Inc	82M 279, 280, 281	Zn, Pb, Ag	Stratiform	DD	SC
Burnt Ridge	Elk Valley Coal Corp	082JSE001	Metallurgical coal	Sedimentary	A, RC (4496 m; 17 holes)	SE
Castle/Bare Mountains	Elk Valley Coal Corp	082JSE006, 008	Metallurgical coal	Sedimentary	A, RC (4858 m; 12 holes)	SE
Cariboo Gold Quartz	International Wayside Gold Mines Ltd	093H 019	Au	Vein, Replacement	A, G, GC, DD (4518 m; 26 holes)	C
Century Limestone	Doublestar Resources Ltd	(92E 10E)	limestone	IM	GC, MAG, DD(3000 m planned)	SW
Chica / Chiora	Amarc Resources Ltd		Au-Cu	Calc-alkalic Porphyry	A, IP, DD (960 m)	C
Congress	Levon Resources Ltd	92JNE029, 131, 132, 133	Au, Ag, Cu, Sb	Mesothermal Vein	DD (1061 m), TR, MS, GC	SC
Copper Creek	Firesteel Resources Inc	104J 035	Cu, Au	Porphyry	TR (509 m); DD (1524 m)	NW
Corey	Kemrich Eskay Mining Corp	104B 011, 355	Au, Ag	Epithermal VMS	DD (6901 m)	NW
CR	Manson Creek Resources Ltd	93L 007, 269	Cu, Mo	Porphyry	GC, DD (1580 m)	NW
Craigmont	Christopher James Gold Corp	92ISE035	Cu	Skarn	GP, DD (~3000 m)	SC
Dauntless	SYMC Resources Ltd	092F 168	Cu-Ag	Vein	DD(1062 m; 15 holes); TR(400 m; 15); A (2.5 km)	SW
Davidson (Yorke-Hardy)	Blue Pearl Mining	93L 110	Mo, W	Porphyry	EN, UG (rehab)	NW
Del Norte	Sabina Recources Limited	104A 176, 161	Au, Ag	Epithermal Vein	AB-EM, DD (1400 m)	NW
Dude	Pathfinder Resources Ltd	092F 276	Cu+Mo+Au	Porphyry	GC, RC(1270 m; 6 holes)	SW
Dusty Mac	Ecstall Mining Corp	82ESW078	Au, Ag	Epithermal Vein	GP, DD (1400 m)	SC
Elizabeth	J-Pacific Gold Inc	92O 012	Au, Ag, Cu, Mo	Mesothermal Vein	DD (~2788 m; 19 holes)	SC
Elk (Swash North)	Almaden Minerals Ltd	92HNE096	Au, Ag	Mesothermal Vein	DD (8395 m; 36 holes)	SC
Eskay Creek	Barrick Gold Corp	104B 008	Au, Ag	Epithermal VMS	UG-DD, 16 000 m	NW
Extra High (Kamad 7)	Brionx Ventures Inc	82M 277	Au, Ag, Cu, Pb, Zn	Kuroko-type VMS	TR, DD (~1700 m)	SC
Falling Creek	Kennecott Canada Exploration Ltd	093O 034-036	Coking and PCI Coal	Sedimentary	G, RD (2349 m; 12 holes); GP, CQ	NE
Five Cabin	Hillsborough Resources Ltd		Coking Coal	Sedimentary	A, G, TR, RD & DD (14 430 m; 121 holes); GP, CQ, PF, EN	NE
Foremore	Roca Mines Inc	104G 148	Cu, Zn, Ag, Au	VMS	AB-EM / MG, DD (2200 m)	NW
Frijn	Yankee Hat Industries Corp	093N 207	Au-Cu	Alkalic Porphyry	A, P, G, GC, DD (3028 m; 16 holes)	C
Galore Creek	NovaGold Resources Inc	104G 090, 092, 095, 099	Cu, Au	Skarn, Alkalic Porphyry	3D-IP, DD (54 409 m); DD-MS (3496 m); GD (5330 m); EN	NW
Getty North	Getty Copper Inc	92INE008	Cu	Calc-alkalic porphyry	G, MS	SC
Gibraltar	Taseko Mines Ltd	093B 005-008, 011-012, 051, 061-063	Cu-Mo	Calc-alkalic Porphyry	CD & DD (6960 m; 40 holes)	C
Golden Eagle	Signet Minerals Inc	104M 057, 075, 085	Au	Epithermal Vein, Skarn	GP, DD (733 m)	NW
Goodrich (Central South)	First Coal Corp	093O 034	Coking and PCI Coal	Sedimentary	A, G, RD & DD (10 750 m; 65 holes)	NE
Grandux	Bell Resources Corp	104B 021	Cu, Ag, Au	VMS	G, AB EM MG, DD (2090 m; 5 holes)	NW
Grouse Creek	Goluem Cariboo Resources Ltd	093H 003, 008	Au	Vein, Replacement	A, DD (6252 m; 44 holes)	C

TABLE 3. CONTINUED

Property	Operator	Minfile (NTS)	Commodity	Deposit Type	Work Program	Region
Hermann	Western Canadian Coal Corp		Coking Coal	Sedimentary	A, G, RD & DD (5511 m, 29 holes); GP, CQ, PF	NE
Highmont East	Highland Valley Copper	92ISE013	Cu, Mo	Porphyry	DD (~4000 m); FS, ES, BK	SC
Huckleberry	Huckleberry Mines Ltd	93E 037	Cu, Mo	Porphyry	DD (6388 m, 33 holes)	NW
Hushamu	Lumina Resource Corp	092L 240	Cu-Au Mo+Ag	Porphyry	AB-MG,EM (2600 line km); P, G, GC; DD (4600 m, 22 holes)	SW
Iron Lake	Argent Resources Ltd / Eastfield Resources Ltd	92P 132	Cu, Au, Pd, Pt	Alkalic Porphyry	GP; DD (505 m, 4 holes)	SC
Iron Range	Eagle Plains Resources Ltd	082FSE014-028	Pb, An, Ag, Cu, Au	IOCG, Sedex	G, GC; DD (945 m, 4 holes)	SE
Iron Ross	Homegold Resources Ltd	092K 043	Magnetite	IM	DD (250 m, 2 holes); BU (4800 tonnes)	SW
Isintok Lake	Jasper Mining Corp	82ENW093	Ag, Cu, Mo	Porphyry	AB GP; DD (~2000 m, 4 holes)	SC
Jersey Emerald	Sultan Minerals Inc	082FSW009-011, 218	Mo, W	Porphyry Mo	DD (2500 m, 16 holes)	SE
Jeune Landing	Sechelt Industrial Minerals Corp	(92L/06)	Dolomite	IM	DD (300 m, 7 holes); A (150 m); hydrographic survey	SW
Kemess - Bear	Northgate Minerals Corporation		Au-Cu	Calc-alkalic Porphyry	A, G; DD (5786 m, 17 holes)	C
Kemess North area	Northgate Minerals Corporation	094E 021	Au-Cu	Calc-alkalic Porphyry	A, G; DD (10,372 m, 23 holes); FS	C
Kerr-Sulphurets	Falconbridge Limited	104B 103, 173, 182, 285	Cu, Au	Porphyry	G; DD (4092 m, 16 holes)	NW
Ketchan	Copper Belt Resources Ltd	92+NE126, 037, 131, 115, 118, 163, 140	Cu, Au, Ag	Alkalic Porphyry	DD (1210 m, 10 holes); G, GP	SC
Kinaskan (GJ)	Canadian Gold Hunter Corp	104G 034, 086	Cu, Au	Porphyry	G; DD (16,394 m, 56 holes)	NW
Klappan	Fortune Minerals Limited	104H 021	Anthracite	Coal	EN; DD (2144 m); RC (951 m)	NW
Kutcho Creek	Western Keltic Mines Inc	104I 060	Cu, Zn, Ag, Au	VMS	DD (7372 m, 20 holes)	NW
Lac La Hache (Ann North, Sout, Peach etc)	GWR Resources Inc	92P 002, 115, 034	Cu, Au, Ag, magnetite	Alkalic Porphyry	AB GP; DD (1788.4 m, 8 holes)	SC
LCR	Eagle Plains Resources Ltd	103I 021	Mo, Cu, Au	Porphyry	DD (2428 m, 20 holes)	NW
Lexington	Merit Mining Corp	082ESE041, 042	Au, Cu	Mesothermal vein, polymetallic vein	IP, MG; DD (3195 m, 19 holes)	SE
LJ	Selkirk Metals Corp	82M 264	Zn, Pb, Cu, Au, Ag	Besshi VMS	D (769.79 m, 3 holes)	SC
Lodgepole	Cline Mining Corporation	082GSE028	PCI coal	Sedimentary	EN, FS; DD (1205 m)	SE
Lorraine - Jajay	Teck Cominco Limited	093N 002, 066, 224	Cu-Au	Alkalic Porphyry	G, GC, IP; DD (3704 m, 17 holes)	C
Lossan	Cline Mining Corporation	093O 031	Coking and PCI Coal	Sedimentary	UG-BU (10 t); RD (4281 m, 28 holes); GP, CQ, PF, F, EN	NE
Lucky Ship	New Cantech Ventures Inc	093L 053	Mo	Porphyry	IP; DD (3804 m, 26 holes)	NW
Lustdust	Alpha Gold Corp	093N 008-009	Au-Ag-Cu-Zn-Pb	Skarn, Manto, Vein	A, TR; DD (5153 m, 16 holes)	C
Macktush	SYMC Resources Ltd	092F 012	Au-Ag-Cu+Mo	Porphyry, Vein	DD (1500 m, 20 holes); A (1.4 km)	SW
MAX	Roca Mines Inc/FortyTwo Metals Inc	082KNW003, 004	Mo	Porphyry	DD (3101 m, 21 holes)	SE
Max (Kamad)	Amarc Resources Ltd	82M025	Au, Ag, Zn, Pb, Cu	Kuroko-type VMS	G; DD (3718 m, 16 holes)	SC
Merry Widow	Granide Portage Resources Ltd	092L 044	Au-Ag+Cu+Co	Skarn	IP (55 line km)	SW
Mineral Creek	Bitterroot Resources Ltd	092F 079, 331	Au-Ag	Vein	DD (2000 m, 15 holes)	SW
Morrison	Pacific Booker Minerals Inc	093M 007	Cu, Au	Porphyry	EN; DD (~1700 m, 8 holes); MS	NW
Mount Polley	Imperial Metals Corporation	093A 008, 164	Cu-Au-Ag	Alkalic Porphyry	G, PD; DD (39,495 m, 98 holes); FS	C
Muskwa	Twenty Seven Capital Corp	094K 054	Cu	IOCG	AB-MG, P, G, GC; DD (420 m, 12 holes)	C
Myra Falls mine	NVI Mining Ltd (Breakwater Resources Ltd)	92F 330, 071, 072, 073	Cu-Zn-Au-Ag-Pb	VMS	DD (36,000 m); UG (800m)	SW
Nechako Gold (Bob)	Endurance Gold Corp	093B 054	Au-Ag	Epithermal Vein	A, G, P, GC; DD (422 m, 3 holes)	C
New Afton	New Gold Inc	92INE023	Cu, Au, Pd, Ag	Alkalic Porphyry	UG; FS; DD (~20,000 m); AB GP	SC
Newmac	Newmac Resources Inc	92N 030, 054, 055	Cu, Ag, Au	Porphyry, vein	DD (~1000 m, 5 holes)	SC
New Polaris	Canarc Resource Corp	104K 003	Au	Mesothermal Vein	DD (~2357 m, 9 holes)	NW
Nithi Mountain	Leeward Capital Corp	093F 006-016	Mo	Calc-alkalic Porphyry	A, G; DD (~6000 m)	C
OK	Goldrush Resources Ltd	092K 008, 057, 155	Cu-Mo	Porphyry	DD (968 m, 6 holes)	SW
Omega	Belcourt Saxon Coal Limited Partnership	093I 014	Coking Coal	Sedimentary	G, RD & DD (1986 m); GP, CQ	NE
Osilinka	Lysander Minerals Corporation	094C 069	Au-Cu	Alkalic Porphyry	A, GC, IP; DD (1447 m, 8 holes)	C

TABLE 3. CONTINUED

Property	Operator	Minfile (NTS)	Commodity	Deposit Type	Work Program	Region
Pakk	Klondike Gold Corporation/Golden Chalice Resources	082FNE115: 117	Zn, Pb, Ag	Sedex	DD (706 m; 1 hole)	SE
Panda	Klondike Gold Corporation	082FSE110	Zn, Pb, Ag	Sedex	DD (1572 m; 1 hole)	SE
Panorama Ridge	Goldcliff Resource Corp	82ESW052: 259	Au	Skarn	DD (~1200 m); TR	SC
Pearson (Bugaboo, Reko)	Emerald Fields Resource Corp	092C 022: 191	PGE, Ni, Cu	Mag. skarn	AB-GP; DD (460 m; 3 holes at Bugaboo); DD (388 m; 4 holes at Reko)	SW
Pil	Finlay Minerals Ltd	094E 029: 083: 213: 216	Au-Cu	Calc-alkalic Porphyry; Epithermal Vein	A; P; G; DD (3088 m; 12 holes)	C
Pine	Cascadero Copper Corp	094E 016: 045: 047: 048: 082: 237	Au-Cu (+/- Mo)	Calc-alkalic Porphyry	A; G; DD (3980 m; 17 holes)	C
Pine Pass	Falls Mountain Coal Inc (Pine Valley Mining Corporation)	093O 007	Coking and PCI Coal	Sedimentary	A; G; TR; RD; GP; EN; DD (16,309 m)	NE
Poplar	Aumega Discovenes Limited	93L 239	Cu, Mo, Au	Porphyry	DD (~3000 m)	NW
Prospect Valley (PV, NIC & RM)	Cons. Spire Ventures Ltd / Almaden Minerals Ltd	none	Au, Ag	Epithermal Vein	GC; P; TR	SC
QCM	Canadian Gold Hunter Corp	093N 200	Au	Mesothermal Vein	A; DD (1802 m; 9 holes)	C
QR	Cross Lake Minerals Ltd	093A 121	Au	Skarn	DD (1972 m; 9 holes); PF	C
Quinsam Coal mine	Quinsam Coal Corp (Hillsborough Resources Ltd)	092F 319	Thermal coal	Sedimentary	RD (1200 m; 6 holes)	SW
Quintette-Babcock Window	Elk Valley Coal Partnership	093I 011	Coking Coal	Sedimentary	A; G; RD (12,109 m; 58 holes); GP	NE
Rabbit South and North	Global Hunter Corp	92INE071: 147: 130: 114	Mo, Cu, Au	Porphyry	DD (2390 m)	SC
Rain (Sorcerer)	Orphan Boy Resources Inc	82M 156	Cu, Zn, Pb, Au, Ag, Mo, W	VMS, Skarn, Porphyry, Vein	DD (~200 m; 1 hole)	SC
Ratena	Happy Creek Minerals Ltd	92ISE092: 150: 060	Cu, Mo	Calc-alkalic porphyry	DD (341 m; 2 holes)	SC
RDN	Northgate Minerals Corp	104G 144	Au, Ag, Pb, Zn	VMS	G; DD (1470 m)	NW
Red Chris	bcMetals Corporation	104H 005	Cu, Au	Porphyry	EN; FS	NW
Red Hill	Avalon Ventures Ltd	92INW042	Cu, Zn, Au, Ag	VMS	DD (1279 m; 6 hills); G; DH GP	SC
Ruby Creek	Adanac Molybdenum Corp	104N 052	Mo	Porphyry	EN; GD; CD (4984 m; 19 holes)	NW
Ruddock Creek	Selkirk Metals Corp / Doublestar Resources Ltd	82M 082: 83	Zn, Pb, Ag	Stratiform	D; AB-EM; DD (2500 m; 4 holes)	SC
Sandon Camp	Klondike Silver Corporation	082FNW043	Ag, Pb, Zn	Polymetallic vein	GC; TR; DD (676 m)	SE
Saxon East	Belcourt Saxon Coal Limited Partnership	093I 016	Coking Coal	Sedimentary	G; RD & DD (1986 m); GP; CQ	NE
Saxon South	Belcourt Saxon Coal Limited Partnership	093I 016	Coking Coal	Sedimentary	G; RD & DD (2578 m); GP; CQ	NE
Schaft Creek	Copper Fox Metals Inc	104G 015	Cu, Mo, Au	Porphyry	EN; DD (3161 m; 15 holes); MS	NW
Sechelt Carbonate	Pan Pacific Aggregates Ltd	092GNW031: 052	Dolomite and other	IM	A (3.1 km road); DD(5-6000 m; 30 holes)	SW
Seel	Gold Reach Resources Ltd	93E 105	Cu, Au	Porphyry	DD (~3000 m)	NW
Seneca	Carat Exploration Inc	092HSW013: 039: 165	Zn-Cu-Pb-Ag-Au	VMS	G; P; GC; IP-EM (25 line km); AB-EM (325 line km); DD (3700 m)	SW
Shasta	Sable Resources Ltd	094E 050	Ag-Au	Epithermal Vein	IP; DD (915 m; 11 holes)	C
Silver Coin	Pinnacle Mines Ltd	104B 095	Au, Ag, Pb, Zn	Vein	DD (5000 m)	NW
Skoonka (Sam)	Strongbow Exploration Inc / Almaden Minerals Ltd	92ISW104	Au, Ag	Epithermal Vein	DD (1257 m; 11 holes)	SC
Spanish Mountain	Skygold Ventures Ltd / Wildrose Resources	093A 043	Au	Mesothermal Vein	A; RC & DD (11,123 m; 65 holes)	C
Sphinx	Eagle Plains Resources Ltd	082FNE004: 094: 095	Mo, W	Porphyry Mo	G; GC; A; DD (3330 m; 14 holes)	SE
Sullivan Deeps	Stikine Gold Corporation		Zn, Pb, Ag	Sedex	DD (2750 m; 1 hole)	SE
Summit Lake	Tenajon Resources Corp	104B 034	Au	Intrusion-related vein	DD (2666 m)	NW
Summit Oldtimer	Auramex Resource Corp	082FSW081: 313	Au	Polymetallic vein	DD (2306 m; 25 holes)	SE
Tadpole	Goldrea Resource Corp / Molycor Gold Corp	82LSW009	Mo	Porphyry	DD (1146 m; 10 holes)	SC
Taurus II	Cusac Gold Mines Ltd	104P 016: 077	Au	Orogenic gold	DD (2444 m; 18 holes)	NW
Thorn	Cangold Limited & Rimfire Minerals Corp	104K 031	Au, Ag, Cu	High sulfidation vein	G; IP; DD (656 m; 5 holes)	NW
Tide	Serengeti Resources Inc	104B 129	Au, Ag	Vein	G; AB-EM / MG; DD (967 m; 8 holes)	NW
Trend - Roman Mountain	NEMI Northern Energy & Mining Inc	093I 030	Coking Coal	Sedimentary	A; G; RD (~3000 m; 23 holes); GP	NE
Tulsequah Chief	Redfern Resources Ltd	104K 002	Cu, Zn, Ag, Au	VMS	FS; R	NW
Turnagain	Hard Creek Nickel Corp	104I 051: 119: 120	Ni, Pd, Pt	Magmatic	DD (7143 m; 19 holes)	NW
Upper Fir & Bone Cr	Commerce Resources Corp	83D 035: 036	Ta, Nb, U, Phosphate	Carbonatite	DD (500 m; 8 holes)	SC

TABLE 3. CONTINUED

Property	Operator	Minfile (NTS)	Commodity	Deposit Type	Work Program	Region
Vowell Creek	Jasper Mining Corporation	082KNE009	Ag, Pb, Zn, Au, graphite	Polymetallic vein, sedex	AB-MG; AB-EM; DD (1224 m, 8 holes)	SE
Wasi Creek	Bard Ventures Ltd / Selkirk Minerals Corp	094C 024	Zn-Pb-Ag	Replacement	P; G; EM; DD (1054 m, 7 holes)	C
WCL	Western Canada Limestone Ltd	82LSW112	Limestone	Industrial Mineral	MS; FS	SC
Westport	Williams Creek Explorations Limited	093H 027, 034	Au	Mesothermal Vein	DD (1460 m, 6 holes)	C
Whipsaw	Canfleur Mining Inc	92HSE102	Cu, Mo, Au, Ag	Porphyry	DD (1220 m, 5 holes)	SC
Wolverine - Perry Creek	Western Canadian Coal Corp	093P 015, 025	Coking Coal	Sedimentary	OP-BU (20 t); CQ; EN	NE
Woodjam	Fjordland Exploration Inc	093A 078, 124	Au-Cu	Alkalic Porphyry	A; G; DD & RC (2925 m, 16 holes)	C

A = access, trail, road construction on claims; AB-EM = airborne electromagnetics; AB-MG = airborne magnetics; AB-RD = airborne radiometrics; BU (X tonnes) = bulk sample (weight in tonnes if known); CD = condemnation drilling; CQ = coal quality testing; CT = carbonization test (coal); DD (Xm) = diamond drilling totaling X metres; EN = environmental baseline studies/monitoring, remediation work; FS = feasibility studies; G = geology, mapping, etc; GC = geochemical sampling (rock, soil, silt, etc); GD = geotech drilling; GP = geophysics (general); IP = Induced Polarization; 3D-IP; MG = magnetics; MK = marketing primarily for industrial mineral products; MS = metallurgical studies; OB = overburden drilling; P = prospecting; PD = percussion drilling; PF = pre-feasibility studies; R = reclamation; RC = reverse circulation drilling; TR = trenching; UG (X m) = X metres of underground development; UG-BU = underground bulk sample; OP-BU = open-pit bulk sample; UT = UTEM; VLF; WT = washability test (coal)

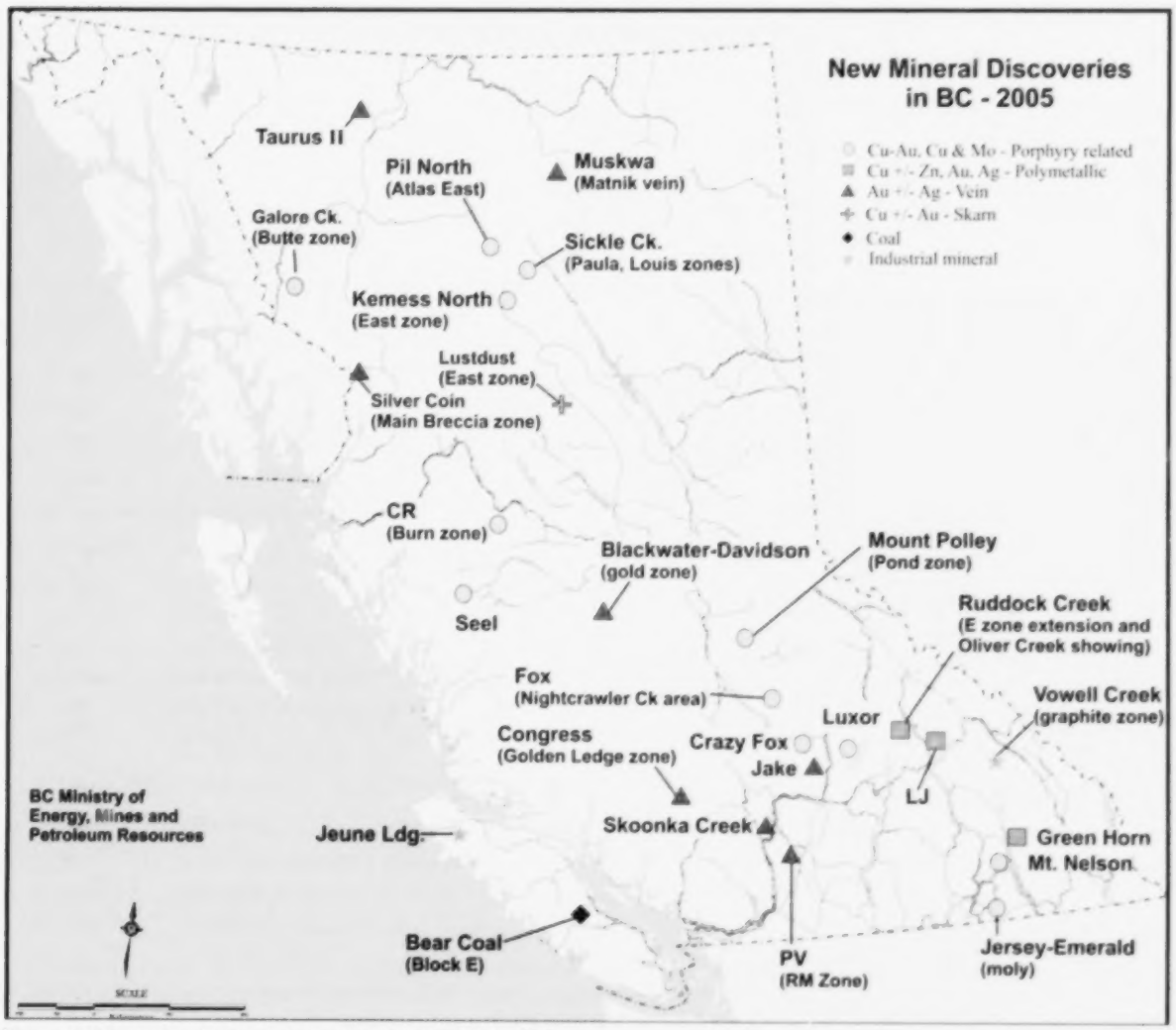

Figure 10. New mineral discoveries in British Columbia in 2005.

Cominco, under an option agreement with Eastfield Resources and Lysander Minerals, carried out property-wide exploration, including drilling, on the large **Lorraine** copper-gold property, northwest of Fort St. James. Drilling intersected a western and southern extension to the Main zone (e.g. 1.19% Cu over 30 metres). Lysander drilled its **Osilinka-Cat** porphyry gold-copper prospect, which adjoins the Lorraine property on the north. Several other properties were evaluated, including **Chica** and **Chona** (Amarc) and **Fran** (Yankee Hat Industries).

Just southeast of the Endako mine, Leeward Capital completed a large drilling program on its **Nithi Mountain** molybdenum deposit. A resource calculation is in progress.

In the Nechako Plateau area, exploration targeted epithermal gold-silver prospects, including **3Ts** and **Blackwater-Davidson** (Silver Quest Resources) and **Nechako Gold** (Endurance Gold).

Skygold Resources, under an option agreement with Wildrose Resources, drilled their sediment-hosted **Spanish Mountain** bulk tonnage gold target near Likely. Mineralization in the favourable argillites and metasiltstones has been traced over 1200 metres in length and greater than 250 metres across its axis. Significant results have been reported (e.g. 94.5 metres grading 1.81 g/t Au, including 22.9 metres grading 5.04 g/t Au).

Photo 10. Looking northerly over Spanish Mountain.

South of the Mount Polley mine, Fjordland Exploration (under a joint venture agreement with Wildrose Resources) continued to drill potentially significant gold-copper mineralization in the Megabuck and Takom zones on the **Woodjam** property. A late-season drilling program yielded a 91.7-metre intersection grading 1 g/t Au and 0.22% Cu on the eastern portion of the Megabuck zone.

In the Wells-Barkerville gold belt, drilling evaluated several high-grade mesothermal vein and/or replacement style deposits, including **Bonanza Ledge-Cariboo Gold Quartz** (International Wayside Gold), **Grouse Creek** (Golden Caribou), **Mosquito Creek Gold** (Island Mountain Gold) and **Westport** (Williams Creek Exploration).

Kootenays - Major Exploration Projects

Major molybdenum exploration drilling programs include **Jersey Emerald** (Sultan Minerals) southeast of Salmo, **Sphinx** (Eagle Plains Resources) southeast of Crawford Bay, **Jazz (Stewart)** (Emgold) northwest of Salmo and **Novelty** (Golden Chalice) at Rossland.

Exploration spending on 9 coal projects totalled approximately $5.1 million, including some 23 400 metres of drilling. Exploration was conducted on or adjacent to the **Elkview**, **Fording River** and **Line Creek (Burnt Ridge)** mines, as well as on the **Marten-Wheeler** property 15 kilometres south of Sparwood, on the **Bingay Creek** deposit, 30 kilometres north of Elkford and on the **Lodgepole** deposit, southeast of Fernie by Cline Mining.

Northwest of Kimberley, Stikine Gold Corp drilled a second deep (2736 metres) hole following up on its discovery of Sullivan-style mineralization on its **Sullivan Deeps** project in 2004. A third hole is planned for 2006. Klondike Gold and Golden Chalice targeted the Sullivan horizon at a few locations (*e.g.* **Panda, Payday** and **Pakk**) in the southern Purcell Mountains. Eagle Plains carried out drilling on its Iron Range sedex property, northeast of Creston.

South-Central - Major Exploration Projects

In the Revelstoke area, Selkirk Metals completed drilling programs on its Kneb, LJ and Ruddock Creek zinc-lead-silver sedex properties. At **Ruddock Creek**, it successfully discovered the faulted-off western extension of the E zone mineralization. It also discovered high-grade zinc-lead-silver mineralization at surface in the Oliver Creek valley, approximately 5 kilometres along the projected strike of the E zone mineralization. At **LJ**, it successfully discovered the load source of several high-grade boulders. Near Barriere, Amarc drilled its stratiform, base-metal sulphide **Max (Kamad)** deposit.

Nine kilometres southeast of the Afton mine, Abacus Minerals conducted a deep drilling program for copper and gold below its **Ajax West** pit. Drilling results confirm the continuity of mineralization to a vertical depth of at least 300 metres below the existing pit. It also completed a deal with Afton Operating Company Ltd to acquire its existing infrastructure in the area, including the mill and tailings impoundment facilities.

In the Okanagan region, Almaden Minerals completed another large drilling program on its past-producing **Elk** gold-silver property west of Peachland. It plans to produce a new resource estimate, and will examine the feasibility of re-opening the mine. In the Merritt area, Almaden explored several new epithermal

gold-silver showings, including **Prospect Valley (RM zone)** along with its joint venture partner, Consolidated Spire Minerals, and the **Merit** property. Strongbow Resources, under an option agreement with Almaden, drilled the newly discovered **Skoonka Creek** epithermal gold target. These projects are a few within the emerging Spences Bridge epithermal gold belt between Merritt and Lillooet.

Goldcliff Resources continued to drill its **Panorama Ridge** auriferous skarn property, adjacent to the former Hedley gold mine. Christopher James Gold drilled the former **Craigmont** copper skarn mine at Merritt.

Photo 11. Looking southerly over western extension on E zone, Ruddock Creek.

Photo 12. Looking easterly over the JJ showing, Skoonka Creek property, northeast of Lytton.

Southwest - Major Exploration Projects

North Pacific Alloys Limited continued post feasibility study work on its **Cogburn** magnesium project near Hope. Northeast of Harrison Hot Springs, Pacific Coast Nickel reported significant nickel-copper- PGE mineralization its **Big Nic** and **Katt/Sable** properties. Eagle Plains and Northern Continental drilled their **Harrison Lake Gold (Abo)** gold-silver property, where mineralization is hosted within quartz diorite stocks and breccias. West of Harrison Lake, Carat Exploration completed airborne and ground geophysical surveys and follow-up drilling on its **Seneca** VMS polymetallic deposit.

Near Powell River, Goldrush Resources drilled its OK porphyry copper-molybdenum deposit. On Texada Island, Pathfinder Resources drilled the Dude porphyry copper-molybdenum target.

Lumina Resources consolidated a large tenure in the North Island copper-gold belt, which includes the **Hushamu** deposit with 231 million tonnes grading 0.28% Cu and 0.31 g/t Au, on Vancouver Island. It carried out airborne and ground geophysical surveys and follow-up drilling on this deposit. Near Port Alice, Sechelt Industrial Minerals explored the **Jeune Landing** dolomite prospect and planned a 10 000-tonne bulk sample. Near Gold River, Doublestar Resources drilled its **Century** limestone property.

Compliance Energy tested the **Bear Coal** property, in the historic Cumberland coalfield, which hosts the Hamilton Lake resource of approximately 11 million tonnes. The company discovered a new coal section on Block E. The company is also perusing other coal projects in the area.

Near Port Alberni, Bitterroot Resources drilled its **Mineral Creek** (Debbie and 900 zones) gold deposits. SYMC Resources drilled its **Dauntless** and **Macktush** copper-silver-gold properties. Near Port Renfrew, Emerald Fields drilled its **Bugaboo** and **Reko** nickel-copper-PGE prospects.

BRITISH COLUMBIA EXPLORATION AND MINING INITIATIVES

During 2005, the Government of British Columbia continued a number of measures to assist mineral resource planning, exploration and development, including the release of the provincial Mining Plan.

- In early January 2005, the comprehensive *British Columbia Mining Plan* was released outlining actions to support a thriving, globally competitive, safe and environmentally-responsible exploration and mining sectors that will significantly benefit British Columbians.
- The *British Columbia Mining Exploration Tax Credit Program* provides a refundable 20 percent tax credit towards BC taxes. This program was extended another 10 years to December 31, 2016. The combined federal and BC Flow Through Shares tax credit programs (referred to as Super Flow Through Shares) were scheduled to end on December 31, 2005, with look back provisions for mineral exploration expenditures during 2006.
- Mineral Titles Online, an internet-based mineral tenure system, was instituted on January 12, 2005.

Within the first few days, the equivalent number of tenure units acquired equaled the total number for 2004, and the total mineral tenures for 2005 were forecast to increase fourfold over 2004.

- Geoscience surveys were completed in the Canim Lake, Eskay Creek (Bowser Basin rim), Port McNeil, Terrace and Toodoggone areas. Economic geology studies were also carried out on porphyry copper deposits, coal, diamonds and industrial minerals (*see* Figure 11).
- Regional geochemical survey data was released for the Bowser River (NTS 104A) and Spatsizi (NTS 104H) area
- MapPlace, MINFILE, CoalFile and Assessment Report databases were significantly upgraded and expanded, and made more accessible to clients: www.em.gov.bc.ca/geology.
- Staff completed marketing projects in Vancouver and Toronto to attract global mineral industry investment to British Columbia. Numerous offshore Trade delegations met with government officials in Vancouver and Victoria, regarding the acquisition of a variety of projects and their products.
- Over the past year the BC Geological Survey published Geological Fieldwork 2005, Exploration and Mining in British Columbia 2005, 18 Open File maps and reports, 3 Geoscience Maps, 25 GeoFile maps, reports and data and 3 Information Circulars. One of the highlight products this year has been the new, 1:250 000-scale, digital geological map of the Province – the first lithology-based map of the Province in over 25 years.

MINERAL EXPLORATION AND DEVELOPMENT OUTLOOK FOR 2006

The positive trends in exploration spending, drilling programs, successes at advanced exploration projects, and the number of significant property acquisitions all bode well for a very busy 2006 exploration season in British Columbia. Coal, gold, open-pit copper, high-grade molybdenum, and bonanza-gold targets continue to be a focus of exploration throughout the province.

Most metal prices are expected to continue at high levels through 2006. Coal, gold, copper, molybdenum, zinc, lead and platinum are the main commodities currently attracting mineral exploration attention.

The **Trend** and **Wolverine-Perry Creek** coal projects, and the **MAX** molybdenum project, are expected to open in 2006. Many advanced exploration projects expect to have a feasibility study completed in 2006 (*e.g.* **Davidson, Galore Creek, Mt. Milligan, New Afton** and **Schaft Creek**). The revival of coal exploration and developments, particularly those in the northeast, continue to help revitalize the Ridley Island terminal near Prince Rupert.

The strengthening of the international coal markets is expected to continue. Production, development and exploration activities in the northeast (*e.g.* **Brule, Perry Creek, Trend, Goodrich-Central, Falling Creek** and **Lossan**) and southeast (**Bingay Creek and Lodgepole**) will continue to increase. In the northwest, the **Mount Klappan** anthracite coal deposit is being considered for development.

The potential for new, high-grade **Eskay Creek**-style, Au-Ag occurrences continues to attract attention, particularly in the northwest. With the strong zinc and lead prices, the search for Sullivan-type deposits in the southeast and the sedex deposits in the Gataga belt in the northeast is expected to intensify.

Industrial minerals production continues to grow steadily through developing additional markets and mining more commodities. In 2006, it is anticipated that industrial clays, limestone and aggregate sales will improve. Sulphur sales are expected to be particularly strong again next year.

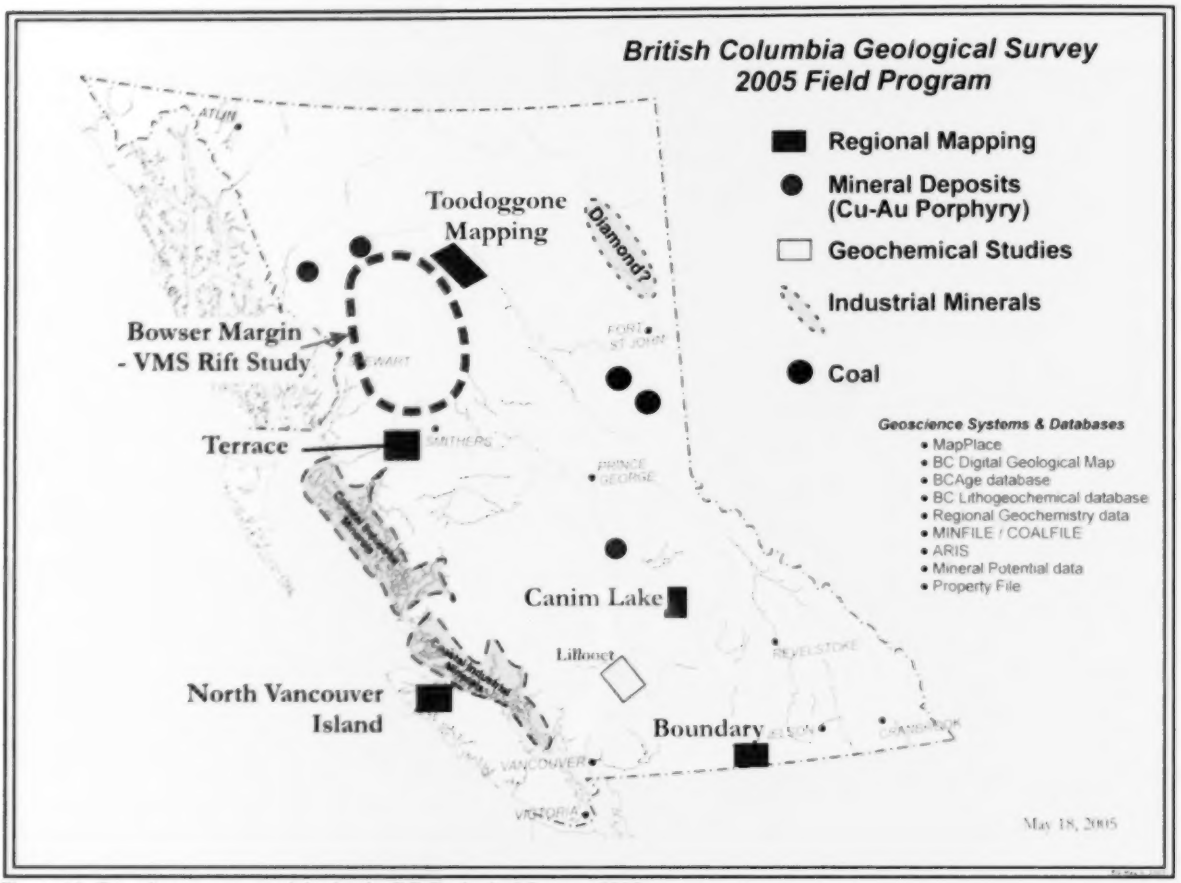

Figure 11. Geoscience survey activity by the BC Geological Survey, 2005.

For additional information contact:

Tom Schroeter	Senior Regional Geologist	Vancouver	604-660-2812	Tom.Schroeter@gov.bc.ca
Paul Wojdak	Regional Geologist	Northwest	250-847-7391	Paul.Wojdak@gov.bc.ca
Bob Lane	Regional Geologist	Northeast/Central	250-565-4324	Bob.Lane@gov.bc.ca
Mike Cathro	Regional Director	South-Central	250-371-6060	Mike.Cathro@gov.bc.ca
David Grieve	Regional Geologist	Kootenay	250-426-1658	David.Grieve@gov.bc.ca
Jamie Pardy	Regional Geologist	Southwest	604-660-2713	Jamie.Pardy@gov.bc.ca
George Simandl	Industrial Minerals Geologist	Victoria	250-952-0413	George.Simandl@gov.bc.ca
Barry Ryan	Coal Geologist	Victoria	250-952-0418	Barry.Ryan@gov.bc.ca